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EXAMINER

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18M1

ART UNIT	PAPER NUMBER
1811	13

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This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☐ Responsive to communication filed on _____ ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), 0 days from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☒ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice re Patent Drawing, PTO-948.
3. ☒ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, Form PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____

Part II SUMMARY OF ACTION

1. ☒ Claims 1-17 are pending in the application.
   Of the above, claims 1-2, 7-15 are withdrawn from consideration.
2. ☐ Claims _____ have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☒ Claims 3-6, 16-17 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable. ☐ not acceptable (see explanation or Notice re Patent Drawing, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____ has (have) been ☐ approved by the examiner. ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed on _____, has been ☐ approved. ☐ disapproved (see explanation).
12. ☐ Acknowledgment is made of the claim for priority under U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

STATUS OF THE CLAIMS:

Claims 1-17 are pending.
Claims 1-2,7-15 are drawn to nonelected inventions.
Claims 3-6 and 16-17 are under consideration.

Applicant's election with traverse of Group I in the supplemental restriction in Paper No. 12 is acknowledged. The traversal is on the ground(s) that there is no undue burden of search to search claims 11 and 12. This is not found persuasive because of the reasons recited in the supplemental restriction.

The requirement is still deemed proper and is therefore made FINAL.

The following is a quotation of the first paragraph of 35 U.S.C. § 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification is objected to under 35 U.S.C. § 112, first paragraph, as failing to provide an adequate written description of the invention and failing to adequately teach how to make and/or use the invention ie. failing to provide an enabling disclosure.

On page 33 of the specification applicant discloses peptide sequences using X to denote potentially glycosylated residues. Applicant has failed to adequately describe such peptides which contain X amino acid residues.

Applicant has failed to enable the described and claimed invention for the following reasons.

Applicant claims polypeptides which "comprise" specific amino acids sequence as well as incomplete amino acid sequences (ie. sequence ID No. 17-19 which contain unspecified or

alternative amino acid residues). Applicant has failed to enable the method of making polypeptides which "comprise" the given sequences since the rest of the compound which possesses a given sequence is unduly broad because of the indefinite nature of such terminology used to describe the disclosed and claimed compounds. "Comprise" would suggest additional element the extra elements not specifically taught or suggested by applicant's disclosure.

Additionally, applicant has failed to enable these peptides bound to a "solid support" because applicant has failed to enable the scope of the term "solid support" bound to a peptide which encompasses many different uses such as affinity chromatography, peptide syntheses columns, glassware, assay supports etc. The claimed scope is not commensurate to the teaching of the disclosure.

Applicant has clearly failed to enable the method of using such compounds either diagnostically or therapeutically to treat cancer. The treatment of cancer is highly unpredictable and requires extensive clinical data in order to establish that the treatment of tumors, cancer and neoplastic diseases is efficacious for all types of cancer, hosts and modes of administration that the specification encompasses.

Additionally, the broad scope of polypeptides disclosed and claimed are not demonstrated to possess any activity that would render one reasonably to expect the asserted utility. Even assuming arguendo that the protein, "autotaxin", possess a given activity correlatable to diagnosing or treating cancer one would not expect a fragment of such a protein to exhibit the same activity as the parent compound without data supporting such activity, because the primary, secondary, tertiary and quaternary structure of the protein necessary for the protein's activity is not present in the peptide.

Applicant presents a list of prospective uses both diagnostic and therapeutic with respect to cancer on pages 13-16 that absent examples and guidance present in applicant's specification are speculative at best. Applicant provides no support (treatment or assay) for any of these alleged uses regarding such polypeptides.

Claims 3-6 and 16-17 are rejected under 35 U.S.C. § 112, first paragraph, for the reasons set forth in the objection to the specification.

35 U.S.C. § 101 reads as follows:
"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title".

Claims 3-6 and 16-17 are rejected under 35 U.S.C. § 101 because

a. the claimed invention is directed to nonstatutory subject matter.

b. these claims lack patentable utility.

Products of nature are not patentable subject matter. Applicant is claiming a polypeptide which is "naturally" associated with proteins. Such a polypeptide present in nature is not patentable.

Applicant's disclosed and claimed invention lacks patentable utility for reasons discussed in the rejection of the claims above under 35 USC 112, first paragraph with respect to lacking sufficient exemplification of utility for the breadth of the claimed peptides in therapeutic and diagnosis of cancer.

Utility must be definite and in currently available form;" A patent is not a hunting license. It is not a reward for the search, but compensation for its successful conclusion." (Brenner v. Manson, 383 U.S. 519, 148 USPQ 689) not merely for further investigation or research but commercial availability is not necessary. Proof of utility under this section may be established by clinical or in vivo or in vitro data, or combinations of these which would be convincing to those skilled in the art. (In re Irons, 52 CCPA 938, 340 F.2d 924, 144 USPQ 351.

Applicant's disclosed and claimed invention clearly is speculative in nature lacking patentable utility.

Claims 3-6 and 16-17 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claims 3-6 and 16-17 are indefinite for the following reasons. Applicant uses the claim language "comprising" the following amino acid sequence which fails to distinctly claim the amino acid sequence of a given peptide or protein. Such claim language is generally used in processes to mean that there may be additional step(s) or when claiming the makeup of pharmaceutical compositions to mean that other ingredients may be present. It is confusing that Applicant has used the claim language "comprising" for describing a chemical formula. Applicant is encouraged to use such claim language as "having the following amino acid sequence" or "containing the following amino acid sequence.

B. In claims 3,5,16 and 17 using the terms "an amino acid sequence corresponding to autotaxin" and "corresponding to autotaxin" to define the claimed peptide is indefinite for the following reasons. How does the claimed polypeptide "correspond" to another sequence. Another words in what manner must the peptide "correspond"? The complete sequence of Autotaxin is not known in the art or in applicant's specification. How does a sequence correspond to an unknown sequence?

C. In claims 3 and 5, the term "at least 5 amino acids thereof" is indefinite as lacking metes and bounds ie. an upper limit of amino acids.

d. In claims 5 and 17, the term "bound to a solid support" is indefinite as to the means and method of attachment of the polypeptide to the solid support.

e. Claims 3-6 and 16-17 fail to adequately define the invention. The description of the polypeptide or protein that is set forth in the claims is insufficient to describe with particularity the substance that is being claimed. The description is in functional language and does not define the physical characteristics of the polypeptide or protein. Physical characteristics would include molecular weight, electrophoretic mobility, isoelectric point, sedimentation coefficient or other physical characteristics that would fingerprint the molecule being claimed. It is established law that a claim should set forth with particularity the substance that is being claimed. These claims with their functional language do not set forth the invention with particularity. The partial sequence does not remedy this lack of description since the remainder of the molecule is not defined. Nor does a designated name "autotaxin", which is arbitrary without an art recognized physical characteristic or sequence for such a name, resolve applicant's burden to clearly define the compound being claimed.

f. Use of the term "solid support" in claims 5 and 17 are indefinite as to the chemical composition of such a support. Such a term lacks metes and bounds since it encompasses resins, affinity matrices, test tubes etc.

g. Claims 3 and 16 are indefinite as to the interpretation of the following language: " free of proteins which it is naturally associated". Does this mean that it is present in the cell alone or are other proteins present? What are the other proteins being referred to? Is applicant attempting to assert a specific degree of purity?

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 3 and 16 are rejected under 35 U.S.C. § 102(b) as being anticipated by Liotta et al. PNAS USA Vol. 83, 3302-06 (5/86).

Liotta et al. teach a polypeptide cell motility stimulating factor isolated from human A2058 melanoma cells which would comprise an amino acid sequence corresponding to autotaxin.

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

Claims 5 and 17 are rejected under 35 U.S.C. § 103 as being unpatentable over Liotta et al. PNAS USA Vol. 83, 3302-06 (5/86) in view of Yarmush et al., US 5,003,047(3/91; filed 1/89).

Liotta et al. teach a polypeptide cell motility stimulating factor isolated from human A2058 melanoma cells which would comprise an amino acid sequence corresponding to autotaxin.

This reference compound differs from applicant's claimed compound insofar that applicant attaches the compound to a solid support.

Yarmush et al. teach a method for purifying a biologically active ligate by attaching a ligand which has affinity for such ligate to a solid support. See ie. abstract. The means of attaching different ligand including cytokines to such a support

is taught by conventional techniques. See ie. column 4, lines 24-50.

Therefore, it would have been prima facie obvious to one skilled in the peptide art to attach the primary reference compound to a solid support as taught by the secondary reference for the benefit of affinity purifying a biologically active ligate possessing affinity for such a ligand as taught by the secondary reference and thus arrive at applicant's claimed peptide bound to a solid support.

Any inquiry concerning this communication should be directed to Examiner Celsa at telephone number (703) 308-0196.

Bennett Celsa
March 1, 1993

MERRELL C. JOHNSON, JR.
SUPERVISORY PATENT EXAMINER
GROUP 180